

FIREWISE CONSTRUCTION, DESIGN & MATERIALS

Creating and maintaining survivable or defensible space is the necessary first step. The next step is to use fire-resistant building materials and construction techniques in retrofitting your home.

Keep in mind that a wildfire sees your home as just another fuel source. The survivable space you construct around your home will keep all but the most disastrous wildfires at bay. However, if the wildfire does break through your first line of defense, an ignition might occur on your home's exterior. The ideal situation is for your home's exterior materials to prevent or retard the flames from burning into your interior walls, soffits, attic area and rooms.

Ignition is a function of the amount of heat applied to a structure and the length of time that heat is applied. Given the cause of structural ignitions, it is best to:

- **Reduce** the amount of heat the structure will be exposed to through vegetation management and construction design.
- **Limit** the time the structure is exposed to heat through vegetation management and construction design.
- **Use** fire-resistant building materials.

Location

The location of your home or other structure on the site in relation to the surrounding wildland vegetation and the local topography has a direct relationship to its survivability. Avoid placing structures on steep side slopes because fire spreads up to 16 times faster up a steep slope than on flat ground. Up slope spread has greater flame lengths which may expose a structure directly to flames. Avoid building at the top of steep gullies or ravines, which firefighters call "chimneys", because they accelerate wind flow and can concentrate heat.

Structures should be "set back" from the edge of the downhill slope for at least 30 feet (more if possible). With houses set back from the slope edge, flames, convective heat and firebrands from fires spreading upslope tend to loft over the top of the house rather than directly impacting it. The duration of radiant heat impact on the downhill facing side of the house is also reduced. Setting the house back from the top

of the slope significantly reduces the amount of radiant heat that the house will be exposed to.

Taking Inventory

Examine your home's construction and materials. Use the following as a checklist.

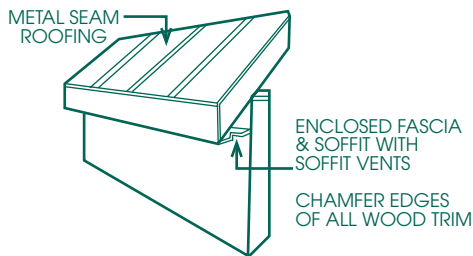
- ☐ What type of roof covering do you have? Asphalt, wood, concrete, tile or metal?
- ☐ Do you have large windows or sliding glass doors that border or face the wildland? Are they single pane, double pane or tempered glass?
- ☐ How are your home's attic and sub-floor vents protected? Are their covers metal or vinyl?
- ☐ How are your eaves, fascias and soffits constructed? Are they made from vinyl, wood or metal?
- ☐ Are spark arresters installed on all your home's chimneys?
- ☐ Does your home have a deck or balcony that overhangs a slope?
- ☐ What are your home's exterior walls covered with? Are they wood, aluminum or vinyl siding, stucco, brick or concrete masonry?
- ☐ Is there a porch, garage or wood fence that attaches directly to your home?

Taking Action

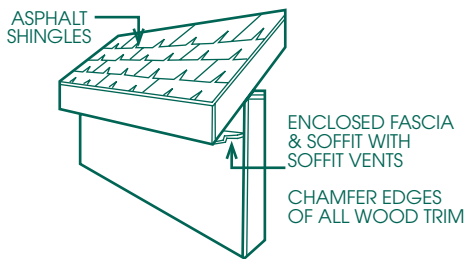
Now you will need to decide on the best modifications for your home, given your risk.

Roof: The roof is the most vulnerable part of your home to wildfires. During a wildfire, firebrands can fall on your roof, landing in your roof's nooks and crannies where a fire can easily start. Once your roof covering does ignite, chances are very good that the rest of your home will follow.

The best way to avoid this situation is to make sure your roof is fire-resistant. There are three levels of classification awarded under the test protocol, A, B and C, with A being the most fire resistant. Some treated wood shake shingle products have ratings of



ROOF MATERIAL



ROOF MATERIAL

Class C or better. Over time, the effectiveness of this chemical is reduced by weathering before the end of the product's useful life and may leave your roof unprotected. If your roof needs to be re-covered, consider installing a Class A roof covering.

Exterior Walls: Exterior walls are susceptible to a wildfire's radiant and convective heat. Although a fire on an exterior wall may not penetrate inside your home, the fire can 'bridge' to more vulnerable areas such as eaves, soffits, vents and windows.

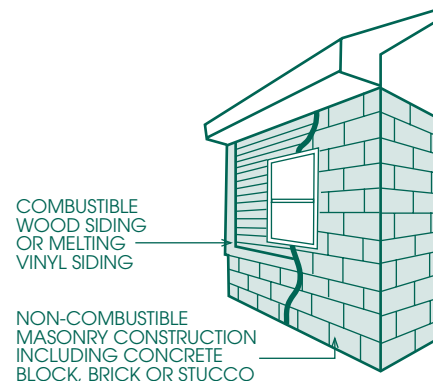
Wall materials that resist heat and flames include cement, plaster, stucco and concrete masonry such as stone, brick or block. Though some materials will not burn, such as vinyl, they may lose their integrity when exposed to high temperature and fall away or melt providing the fire with a direct path inside the home.

Wood siding is relatively fire resistant and can be safely used in areas where it's fire resistance is not compromised by flammable vegetation, woodpiles, stored building materials, etc., next to the siding.

Vinyl siding melts at relatively low temperatures, exposing what is underneath it to the possibility of ignition. Metal siding and stucco will not burn or melt at typical wildfire flame temperatures.

Many exterior building materials thought to be fire-resistant, however, are compromised by improper

installation, poor placement of openings, lack of maintenance or the presence of combustible materials against or adjacent to them. The selection of fire resistant exterior wall coverings should always be underlain with solid sheathing. Not only does this sheathing provide additional fire resistance, it also provides additional shear resistance dramatically reducing high wind damage. Solid sheathing is a must where vinyl siding is used since this siding is the first to fail under radiant heating.



SIDING

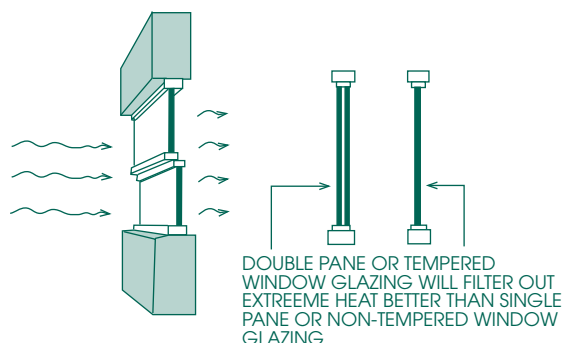
Exterior Windows, Glass Doors and Skylights: Exposure to the heat of a wildfire can cause glass to fracture and collapse leaving an opening for flames and firebrands to enter your home. This applies to both double pane and single pane glass since double pane glass is only slightly more resistant to heat than single pane glass.

On the other hand, single or double pane tempered glass windows doors and skylights typically fracture at higher exposures, well above the radiant heat exposures capable of igniting the surrounding wood. Radiant energy from burning vegetation or from an adjacent burning structure can ignite flammable materials inside a structure through the windows (even if the window remains intact).

Solid core wood doors provide an effective fire barrier (steel jacketed, insulated doors are better).

Eaves, Fascias, Soffits: Eaves, fascias and soffits are vulnerable to both firebrands and convective exposures.

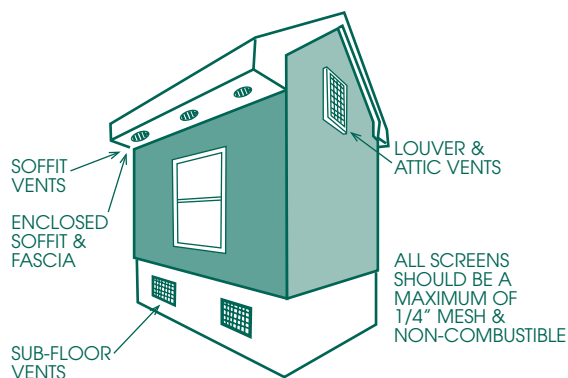
Eaves, fascias and soffits should be 'boxed' or enclosed with noncombustible materials to reduce the size of the vents. Materials that melt or burn in relatively low temperatures, such as PVC and vinyl



WINDOW GLAZING

siding, should not be used since they do not provide adequate protection and can melt in the heat of the wildfire. Non-combustible screening should be used in the vents.

Attic, Sub floor or Foundation Vents: Wind and/or direct contact with a fire's convective heat can push firebrands through the vents into your home's basement or crawl space.

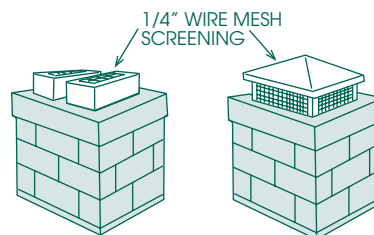


SCREENS AT VENTS

Your vent openings should be screened to prevent firebrands or other objects larger than 1/4 inch from entering your home. Both your vents and screens should be constructed of materials that will not burn or melt when exposed to radiate or convective heat or fire-brands. Also, these vents should be corrosion-resistant to help minimize required maintenance.

Fireplace chimneys: Windblown embers can access your home through your fireplace's chimney flue. Once inside, these firebrands then collect on flammable objects greatly increasing the chance of combustion. The situation can also be reversed: embers from your own fire can fly out the chimney and start a wildfire right in your own neighborhood.

The best way to avoid this situation is to install a spark arrestor made from welded wire or woven wire mesh with openings less than 1/4 wide.



CHIMNEY SCREENS

Overhangs and Other Attachments: Overhangs and other attachments include any additional structures attached to a residence such as room push outs, bay windows, decks, porches, carports and fences. These features are often very vulnerable to convective exposures.

When assessing your home and property, if the feature in question is attached to your home, it should be considered part of your home.

There are a number of ways you can reduce the vulnerability of your home's overhangs and attachments. First and foremost, remove all fuels around these areas. Next, box the undersides of the overhangs, decks and balconies with noncombustible or fire-resistant materials to reduce the possibility of ignition. For fences, make sure that they don't attach directly to your home.

Overhangs and other attachments: have the potential to "trap" heat under patio covers, decks, porches and exterior stairways. Wood decks on posts or cantilevered out over steep slopes are especially vulnerable to wildfires spreading up the slopes. Porches and decks are not usually ignited by falling firebrands and are relatively fire resistant as long as vegetation and accumulated leaves and litter are removed from under them. Screening or lattice can keep debris from accumulating.



WOOD PILES, DECKS, FENCES, ETC.



For more information about the Tennessee Firewise Communities Program, contact the Tennessee Department of Agriculture, Division of Forestry, P.O. Box 40627, Nashville, TN 37204; 615-837-5537; Fax: 615-837-5129 or visit our Web site at:
www.state.tn.us/agriculture/forestry